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SECTOR 7 — CHART INFORMATION

SECTOR 7

COAST OF MEXICO—CABO CATOCHE TO THE RIO GRANDE

Plan.—This sector describes the coast of Mexico from Cabo Catoche W along the N coast of the Peninsula de Yucatan, then S and W around the shores of the Bay of Campeche, and then N to the Rio Grande.

General Remarks

7.1 The E coast of Mexico between Cabo Catoche and the Rio Grande extends WNW for 615 miles.

Peninsula de Yucatan, which forms the SE side of Mexico, has as its E side the coast between Chetumal Bay and Cabo Catoche. The N coast of the peninsula extends in a general W direction for about 190 miles between Cabo Catoche and Punta Boxcohuo. The W side of the peninsula extends 105 miles S from Punta Boxcohuo and then an additional 78 miles SW to the W entrance of Laguna de Terminos. The N and W sides of the peninsula are low and arid, and have very few conspicuous landmarks.

Banco de Campeche, an extensive coastal bank, as defined by the 200m curve, extends up to 155 miles N from the N side of the Peninsula de Yucatan and as far as 120 miles from the W side of the peninsula. This bank is very steep-to, has irregular depths, and many cays, shoals, and reefs are found within its limits.

Between Punta Boxcohuo, the NW extremity of the peninsula, and Cabo Rojo, 390 miles W, the coast recedes 195 miles S to form the Bay of Campeche. The E side of the gulf is formed by the Peninsula de Yucatan, the S side by the coast between Laguna de Terminos and Punta Zapotitlan, and the W side by the coast between Punta Zapotitlan and Cabo Rojo. The low E and S coasts of the gulf are indented by several lagoons. The coastal plain on the W side of the gulf is backed by mountain ranges rising 10 miles inland. The S and W parts of the gulf have regular depths and few off-lying dangers. Numerous rivers discharge into the gulf along its S and W shores.

From Cabo Rojo, the E coast of Mexico extends farther N for 270 miles to the Rio Grande. This section of coast is marked at irregular intervals by low sand hills and wooded hummocks. Several large lagoons lie adjacent to the coast. Ranges of hills, several of which make good landmarks, stand farther inland.

Puerto Veracruz, Tampico, and Coatzacoalcos are the principal ports for large vessels, but there are also several small ports for vessels with shallow drafts.

Winds—Weather.—The prevailing winds come from directions between the NE and SE, but are interrupted by northers during the cooler months of the year and by tropical cyclones from June to November. Northers generally last about 1 to 2 days, but severe storms last for 2 to 5 days.

Along the E and N coasts of Peninsula de Yucatan, the trade wind freshens in the afternoon and diminishes and shifts to the SE late at night and in the early morning.

Along the W coast, from 1000 to 1400 hours, the interval of change from the land to the sea breeze, the wind falls gradually to nearly a calm and gradually springs up again from the N, and about 1500 hours is established from the NE.

Rainfall varies from 500 to 1,000mm along the coast. Progreso has an average annual fall of 470mm. Precipitation is heaviest near Coatzacoalcos and decreases in both directions along the coast. In general, the maximum occurs in September.

Ships' observations taken in the area between the coast and 20°N, 95°W show early winds predominate for all months but September, October, and November, when the prevailing wind is NE. Average wind velocities range from 8 to 12 knots, being somewhat higher from October to March. Gales are most frequent in October and November, when 4 percent of observations report winds of force 8 or higher.

In the vicinity of Puerto Veracruz and N to 25°N, the prevailing winds are E, with a large percentage of N winds from September to April. The latter period, but more especially beginning with October, is known as the norther season, when the trades are frequently interrupted by northers. The remainder of the year is known as the trade wind season.

Wind velocities average considerably higher during the months of October through April, being highest in December, when ships' observations show an average velocity of 12 knots.

Fog is frequent, but most likely in March.

The climate is hot and humid, although the oppressiveness is considerably lessened during the norther season when cool N winds are felt.

Tides—Currents.—The main offshore current sets W across Banco de Campeche, 20 to 30 miles from the N coast of Peninsula de Yucatan, at a velocity of 0.5 to 1.5 knots. It then sets SW across the Bay of Campeche and N, following the trend of the coast to the Rio Grande, 20 to 30 miles offshore, decreasing somewhat in velocity. From October to May, the current circles the Bay of Campeche in a counterclockwise direction a distance of 10 to 30 miles offshore at a rate of 0.3 to 0.5 knot.

Off the mouth of the Rio Grande and anywhere within 100 miles of the coast, the current is mainly governed by the prevailing wind, setting N in the summer and S in the winter.

Banco de Campeche

7.2 Banco de Campeche extends 155 miles N from the N coast of Peninsula de Yucatan and 120 miles W from its W side.

From a position lying 35 miles E of Cabo Catoche, the 200m curve, which defines the limits of this bank, extends N and NW for 170 miles, then irregularly W and SW to a position lying 140 miles NW of Punta Boxcohuo. It then extends S quite regularly at a distance of 120 miles off the W side of the peninsula.

From a position lying 14 miles N of Cabo Catoche, the 20m curve extends W along the N side of the peninsula at a distance

of 12 to 18 miles offshore to a position lying 24 miles N of Punta Boxcohuo. On the W side of the peninsula, the 20m curve extends SW and S at a distance of 20 to 38 miles offshore. All of the dangers contained within this curve are described under the principal description of the coastal features. This steep-to bank has very irregular depths and is marked on its E and N edges by heavy ripples and a confused sea. Some of the dangers within the limits of the bank are marked by discolored water.

Banco de Campeche has not been surveyed for many years and, as reports of new shoals are constantly received, it is reasonable to assume that many more dangers exist than are shown on the area charts.

The following shoals were reported in the years indicated with the distances and bearings from Cabo Catoche (21°36'N., 87°04'W.):

1. A 6.4m shoal (1932), 13 miles N.
2. An 18m shoal (1968), 25.5 miles ENE.
3. A 12.8m shoal (1960), with a 16.5m depth (1967) close E of it, 38 miles NNE.
4. A 25.6m patch (1973), 33.5 miles NE. Several shoals, with depths of 27 to 58m, lie within 6 miles N through NE of this shoal.
5. A depth of 11m (1971), 58 miles N.
6. A depth of 22m (1957), 61 miles N.
7. A shoal bank, with depths of 110 to 200m (1959), about 120 miles N. An 8.2m patch was reported (1961) to lie on the S end of this shoal bank.
8. A 14.6m depth (1968), 111 miles N.
9. A 27.4m depth (1946), 30 miles E.

The following shoals were reported in the years indicated with the distances and bearings from Punta Yalkubul (21°32'N., 88°37'W.):

1. A small shoal patch (1921), depth unknown, 39 miles NNE.
2. Aeolus Shoal, with a depth of 9.1m, 31 miles N.
3. Iphigenia Rock, with a depth of 14.6m, 26 miles N.
4. Bajos Nortes, two coral banks with depths of 20.1 to 36.6m, lie 5 miles apart, 100 miles N. A 5.5m patch was reported (1907) to lie on the southernmost bank.
5. Granville Shoal, with a depth of 8.2m, about 45 miles WNW. A 12.8m patch lies 10 miles N of Granville Shoal. A 17.4m patch lies 20 miles SSW of Granville Shoal.

7.3 Arrecife Alacran (22°29'N., 89°42'W.), a steep-to half-moon shaped reef, lies 34 miles NW of Granville Shoal. The reef covers an area extending 14 miles N and 10 miles E. The NE side of the reef is composed of a compact mass of coral, awash, on which the sea breaks heavily. The SW side is composed of detached coral heads and sandbanks, with deep water between some of the features. Soundings give no indication of the proximity of the reef. Isla Chica and Isla Pajaros, two small low cays lying 0.3 mile apart, stand near the S end of the reef. Isla Desterrada, a small cay 3m high marked by a light, is located 3 miles within the N edge of the reef.

Isla Perez, a narrow cay 0.5 mile long and 4.3m high, is located 1.8 miles within the S edge of Arrecife Alacran. This cay is marked by a light with a racon. The light tower is fully visible when approaching from the W and is reported to be

radar conspicuous. A gray masonry tower stands adjacent to the light tower.

Anchorage can be taken by small vessels, in depths of 11 to 18m, fine sand, mud and coral, about 0.3 mile E of Isla Perez. The anchorage is approached from the S through an unmarked channel with a depth of 7.3m. This channel should not be attempted without local knowledge. In 1977, a vessel with a draft of 5.5m anchored about 2 miles, bearing 093°, from Isla Perez light, in a depth of 44m, good holding ground.

Isla Desertora, a small cay 4m high, lies 3 miles NW of Isla Perez.

The current usually sets W in the vicinity of Arrecife Alacran at a rate of 1 knot, but may set N or S, depending on the direction of the wind.

Arrecife Madagascar (21°26'N., 90°18'W.), a narrow coral ledge, with a least depth of 2.7m, lies 69 miles SSW of Arrecife Alacran. The sea does not break on this ledge, which is covered with weeds and appears the same color as the water. Two 12.8m patches lie 2 miles and 3 miles W of the ledge.

Breakers were reported (1909) about 6 miles NNE of Arrecife Madagascar.

Arrecife de La Serpiente (Snake Rock), with a least depth of 8.2m, lies 11.5 miles W of Arrecife Madagascar.

7.4 Cayo Arenas (22°07'N., 91°24'W.), a guano-covered cay 6m high, lies on the SE edge of a detached reef, 0.8 mile long. A ledge extends 5 miles W from the cay. The horns of the reef extend 0.5 mile NW and 0.3 mile W from the cay. A small wharf stands on the NW side of the cay. A detached reef, 1.3 miles long, with a rocky patch, 2.1m high, on its S end and a small coral patch, 0.6m high, off its NW end, lies 1 mile E of Cayo Arenas. A stranded wreck lies 0.2 mile W of a light, with a racon, which stands on the reef. The intervening channel is about 0.5 mile wide at its N entrance. At its S end lie three coral patches, with a depth of 4.1 to 8.2m, about 0.3 mile SE of Cayo Arenas.

A 11m patch was reported (1968) to lie about 15 miles ENE of Cayo Arenas. A 14.6m patch lies 3 miles W of the same cay and a 29.2m patch lies 19 miles E of the cay. A shoal, with a least depth of 27.4m, lies about 18 miles ENE of the cay.

Several shoals, with depths between 14.6m and 21.9m, lie between 29 miles and 53 miles SSE of Cayo Arenas. Shoal patches, with depths of 12.8m and 18.3m, lie 60 miles SSW and 54 miles SW, respectively from Cayo Arenas.

A detached pinnacle, with a depth of less than 20m, was reported (1961) to lie 24 miles NW of Cayo Arenas. A detached bank, with depths of 45.7 to 54.9m, was reported (1911) to lie 43 miles NNW of Bajo Nuevo. A depth of 23.7m was reported (1982) to exist 13 miles WNW of Bajo Nuevo.

Anchorage.—Anchorage may be found as charted in the channel, in depths of 15 to 27m, close E of the light.

7.5 Cayo Nuevo (21°50'N., 92°05'W.), with a depth of less than 1.8m, lies 40 miles WSW of Cayo Arenas and is marked by breakers. Depths of less than 36m extend up to 5 miles off the reef's NE side and up to 3 miles off the other sides of this reef. A detached 18.3m patch lies 25 miles NNW of Cayo Nuevo. A depth of 23.5m was reported (1982) to exist 13 miles WNW of Bajo Nuevo.

Banco Ingleses (21°49'N., 91°56'W.), two banks of coral and sand with depths of 9 to 34m, lie with their shallowest part located 8 miles SE of Cayo Nuevo.

Arrecifes Triangulos (20°57'N., 92°14'W.) consists of two groups of coral reefs lying 6 miles apart, which lie 53 miles S of Cayo Nuevo. Depths of 49 to 53m exist in the channel between them.

Triangulo Oeste, a reef 0.8 mile long, with a cay 3.4m high on its SW end, has a ledge with depths of 11 to 16.5m extending NE from the cay. Seal Bank, a ledge with a least depth of 12.8m, lies 1.5 miles farther NE.

A disused lighthouse stands near the light on the cay near the SW end of Triangulo Oeste.

A dangerous wreck lies 22 miles NE of the light on Triangulo Oeste.

Triangulo Este (20°55'N., 92°13'W.) and **Triangulo Sur** (20°54'N., 92°14'W.), which nearly dry, are separated by a channel 0.2 mile wide, with depths of 10 to 20m. A cay, 7.3m high, stands on the S end of Triangulo Este. A stranded wreck lies on the E edge of Triangulo Sur. A reef extends 1 mile NE from the cay, and a coral ledge extends about 1 mile farther NE. Triangulo Sur has a ledge extending about 1 mile SW from the SW cay of several which stand on it.

An 11m patch was reported (1916) to lie 25 miles NNE of Triangulo Este. A rock, awash, was reported (1921) to lie 7 miles S of this patch. A detached 14.6m patch lies about midway between these two dangers.

Anchorage.—Anchorage can be taken, in a depth of 13m, about 1 mile SW of the SW cay on Triangulo Sur.

7.6 Banco Ciudad Condal, a detached shoal with a depth of 11m, lies 8 miles S of Triangulo Este.

In 1977, a depth of 33m was reported to lie 6 miles SE of Banco Ciudad Condal.

Obispo Norte (20°29'N., 92°12'W.) and **Obispo Sur**, two dangerous shoals with general depths of 7 to 18m, lie 25 miles S of Triangulo Este and are marked by discolored water. A passage, about 1.3 miles wide with a depth of 51m, separates the shoals. Obispo Norte has a depth of 4.5m lying near its N end. A dangerous wreck lies between the two shoals.

Banco Pera (20°42'N., 91°56'W.) and **Banco Nuevo**, two shoal banks with least depths of 16.4m and 14.6m, respectively, lie 28 miles and 38 miles SE, respectively, of Triangulo Oeste.

Cayos Arcas (20°13'N., 91°58'W.), the S dangers of Banco de Campeche, are a group of three islets which lie 44 miles SSE of Triangulo Este.

Cayo del Centro, the N and largest, is composed of sand and rises at its S end to a height of 6m. It lies on the SE end of a reef which extends about 1 mile NW and 0.5 mile W from it; this reef is encumbered by foul ground and is always visible. The islet is scantily-covered with grass. Bushes and several clumps of palms are also present. A pair of lighted range beacons, in line bearing 107°, stand on the cay.

Anchorage can be taken in depths of 11 to 18m, coral and rock, about 1 mile WNW of the cay on the alignment of the range.

Cayo del Este, a small cay 3m high, lies on a detached reef lying 0.3 mile SE of Cayo del Centro. The intervening channel has depths of 11 to 25.6m.

Cayo del Oeste, a small 2m cay, lies on a small detached reef about 0.8 mile W of the S end of Cayo del Centro. The narrow intervening passage has depths of 6.4 to 91m.

7.7 Cayos Arcas Terminal (20°10'N., 91°59'W.) ([World Port Index No. 9395](#)), a 24 hour, 7 day a week operation, lies close SW of the cays within the limits of an Area to be Avoided associated with a marine oilfield. Two distribution platforms are situated at the N end of a submarine pipeline carrying oil from the marine oil field, 45 miles S.

Depths—Limitations.—Submarine pipelines are laid from the above platforms to two SPMs within the terminal area. Two moored storage tankers are also in use. The mooring buoys can accommodate vessels up to 275,000 dwt., 347m in length, and 21.3m draft.

Pilotage.—Pilotage is compulsory. Pilots are available Monday through Saturday from 0800 to 1800 local time and on Sunday from 0800 to 1200 local time. An ETA should be sent to Pemex through the agent prior to arrival at the terminal.

A pilot will board incoming vessels 2.5 miles SE of the S SBM or 2.5 miles SW of the platform.

Anchorage.—Vessels can obtain anchorage in the charted anchorage area SE of the terminal.

Directions.—On approaching the terminal, masters of incoming tankers should head directly for the anchorage area, where vessels will be boarded by a mooring master.

Cabo Catoche to Punta Boxcohuo

7.8 Cabo Catoche (21°36'N., 87°04'W.), a sand projection on the N point of Isla Holbox, is fringed by depths of 5.5 to 9m which extend 10 miles N and NE.

The coast from Cabo Catoche extends 85 miles W to Punta Yalkubul, and then 105 miles WSW to Punta Boxcohuo. This section borders the N coast of Peninsula de Yucatan and is low and arid, with few conspicuous landmarks. Many detached shoals and patches fringe this coast. Lagartos Lagoon, a narrow, shallow lagoon, lies parallel to almost all of this section of coast.

Progreso is the only port of any importance. Several small villages lie on the coast.

The 20m curve lies 14 miles N of Cabo Catoche and extends W along the coast 12 to 18 miles offshore to a position 24 miles N of Punta Boxcohuo. The dangers seaward of this curve have been previously described. A shallow coastal bank, as defined by the 5m curve, fronts this coast 1 to 5 miles offshore. Irregular depths lie between the 5 and 20m curves. The dangers within the 20m curve are described under the principal description of the coastal features.

Between Cabo Catoche and Punta Boxcohuo, the current sets W at a rate of 0.5 to 1 knot, following the trend of the coast 30 miles offshore.

The mean rise at springs ranges from 0.4 to 0.7m. The water on the off-lying banks is influenced by the winds, as well as the tides. The effect of the latter may be offset by the wind effect for a period of several days.

Isla Holbox (21°33'N., 87°14'W.) is one of a chain of low, narrow islands which front the coast between Cabo Catoche and Boca de Conil to the W. Punta Francisca is the NW extremity of the island. A chain of cays, fronted by numerous

sand ridges, with depths of 2.4 to 9.1m, extends 8 miles NE from Cabo Catoche and 9 miles NW from Punta Francisca. Bajo Corsario, with a least depth of 4.6m, lies 8 miles N of Punta Francisca.

Boca de Conil (21°29'N., 87°35'W.), 3 miles wide, is the W entrance to Laguna de Yalahua, a shallow body of water lying between Isla Holbox and the mainland. Foul ground extends 7 miles NW from Boca de Conil.

The low, sandy coast between Boca de Conil and Cuyo, 16 miles W, is marked by conspicuous groves of trees near its E end.

Cuyo (21°32'N., 87°41'W.), a town, is fronted by a wharf, 107m long, with a depth of 2.1m alongside its outer end. It stands on the narrow strip of land between the sea and the lagoon which parallels this coast. El Cuyo, a 12m high hill, stands close to the town. A 3.7m shoal lies 5 miles N of the town.

7.9 Las Coloradas (21°37'N., 88°01'W.), fronted by an open roadstead, has two small piers. The principal export is salt, which is barged out to the anchorage. From the N, depths in the approach are 7.3 to 9.1m and are quite regular, with no known dangers in the immediate vicinity. The two piers are reported to be radar conspicuous.

The coast between Cuyo and the Rio Lagartos, 30 miles W, is fronted by a low, sandy beach. The Rio Lagartos is the outlet of the narrow lagoon that parallels this coast.

Alert Patch, with a least depth of 4.6m, lies 14 miles NW of the Rio Lagartos entrance. The existence of this shoal is doubtful.

Bajo Antonieta, a shoal which uncovers 0.6m, lies 4 miles WNW of the Rio Lagartos. Between the Rio Lagartos and Punta Yalkubul, 22 miles W, the coast is more elevated, being 52m higher 6 miles E of the point.

Punta Yalkubul (21°32'N., 88°37'W.) is low and marked by trees. Bajo Carmelita, a shoal with depths of less than 4.6m, lies 11 miles NW of the point. Bajo Pawashick, a shoal with a least depth of 2.7m, lies 9 miles W of the point.

The coast between Punta Yalkubul and Punta Arenas, 13 miles SW, remains low. A shallow lagoon entrance lies close E of the latter point.

Dzilam (Silan), a small town fronted by a pier, is situated 6 miles W of Punta Arenas.

Between Punta Arenas and Progreso, 48 miles W, the coast consists of low sandy beach, slightly wooded, and backed by swampy ground. A prominent coastal light is shown 2 miles SE of the village of Telchac. Several additional villages lie along this section of coast.

Chicxulub, a small village fronted by a pier, is situated 2 miles E of Progreso.

7.10 Progreso (21°17'N., 89°40'W.) ([World Port Index No. 9510](#)), fronted by an open roadstead, is the most important port on Peninsula de Yucatan. Sisal is the principal export.

In the approach to the port from the N the depths are 5.5 to 9.1m and are quite regular. No known shoals or other dangers exist in the immediate vicinity. There is a shoal depth of 7.3m lying about 4 miles N of the piers and a least depth of 4.9m leading up to them.



Telchac Light

Winds—Weather.—The prevailing winds are from the NE to SE. Northers occur between October and March.

Tides—Currents.—The current sets to the W. Storm signals are displayed from a flagstaff near the lighthouse.

Depth—Limitations.—There are two berths at the Intermediate Terminal, each 204m long. They have alongside depths of 4.8m and are used for grain and general cargo.

The Remote Terminal has three berths protected by an artificial island. It is situated at the N end of a causeway and pier, 500m long, which have their root located near Progreso Light. Berth No. 3, 240m long, has an alongside depth of 7m and can accommodate passenger vessels. Berth No. 4 and Berth No. 5 are each 140m long. They have alongside depths of 7m and are designated for container and ferry vessels, respectively.

A turning circle, marked by lighted buoys, has been established for vessels approaching the berths at the Remote Terminal.

The Tanker Terminal has two berths for petroleum products, each 170m long with an alongside depth of 4.8m.

Pino Suarez Pier, close W of the root of the causeway, is in ruins.

Aspect.—When approaching Progreso, the lighthouse is usually the first object to be sighted. A square tower, 18m high, stands close W of the lighthouse. East of the town, and somewhat detached from it, is a large square building close to the coast and partly surrounded by trees. The town itself appears as a group of low gray or white buildings. The piers, together with the warehouses on them, are prominent.

Pilotage.—Pilotage is compulsory for vessels going alongside the pier or shifting anchorage. Pilots board at the anchorage or 1 mile NW of the pier if a vessel is berthing. Pilots are available 24 hours. Vessels should provide an ETA at least 24 hours in advance of arrival.

Anchorage.—Good anchorage can be taken 1.5 miles NW of the entrance buoy, in depths of 9 to 15m, by vessels with drafts up to 6.1m. Vessels with drafts of 4.8m or less can anchor 2.5 miles NW of Pier No. 2, in a depth of 6.4m.

Caution.—Due to the dumping of construction material, mariners are cautioned to avoid the N side of the Remote

Terminal and the E and W sides of the mole, as shown on the chart.

7.11 Puerto de Yukalpeten (21°17'N., 89°43'W.), 3 miles W of Progreso, is used primarily by fishing vessels and yachts. The E breakwater extends approximately 0.1 mile from the shore, while the W breakwater is less prominent. The access channel and the berths alongside the two piers are dredged to a least depth of 3m.

The coast between Puerto de Yukalpeten and Sisal, about 20 miles WSW, is marked by several villages and is more wooded than elsewhere in the vicinity. The village of Sisal is now nearly abandoned.

Arrecife Sisal (21°21'N., 90°09'W.), a coral reef with an obstruction on it, lies 12 miles NNW of Sisal and may be marked by discolored water under certain weather conditions. A 6.4m coral shoal lies 6.5 miles WNW of Sisal.

The coast between Sisal and Punta Boxcohuo, 17 miles SW, is low and sandy. A building in ruins, 5 miles SW of Sisal, is the only conspicuous landmark.

The coast between Sisal and a position lying 5 miles S of Celestun is radar conspicuous.

Punta Boxcohuo to Punta Buey

7.12 Punta Boxcohuo (21°02'N., 90°18'W.), the NW extremity of Peninsula de Yucatan, is a low, sandy projection. Several shoals are reported to lie near the 10m curve, about 9 miles seaward of the point. A 2.7m shoal lies 3 miles N of the point. A shoal, depth unknown, has been reported to lie 20 miles WNW of the lighthouse on the point.

The section of coast forming the W side of the Peninsula de Yucatan and the E side of the Bay of Campeche extends 13 miles SSW from Punta Boxcohuo to Celestun, then 60 miles further S to the town of Campeche. A wide and shallow bank fronts this portion of the coast, preventing even light draft vessels from sighting the shore.

Between Campeche and Punta Morro, 13 miles SW, and Champoton, 20 miles farther S, the coast is bolder and backed by prominent ridges of hills.

Between Champoton and Punta Xicalango, 80 miles SW, the coast is low, wooded, and fronted by a continuous sandy beach. Laguna de Terminos indents the S part of this coast. For a distance of 30 miles SW of Champoton, numerous sand and shell patches, with depths of 4.3 to 9.1m, extend as far as 12 miles offshore.

From Punta Xicalango, the coast extending W for about 45 miles to Punta Buey is low and free of dangers. There are no commercial ports along this section of coast.

Regulations.—A mandatory Maritime Traffic Control System serves the Bay of Campeche. The system includes Areas to be Avoided surrounding the marine oil fields and at Cayo Arcas, precautionary areas at track junctions, and specified traffic lanes. These areas are best seen on the area chart. Control Centers are located at Cayo Arcas, Dos Bocas, and at four additional platforms, designated IXTOC1, AKAL-C, KU1, and ECO1.

Vessels intending to enter an area should report to a Control Center 1 hour prior to entry with the following information:

1. Vessel name.

2. Port of registry.
3. Vessel number.
4. Name of owner (company).
5. Master's name.
6. Destination.
7. Port of departure.
8. Displacement.
9. Draft.
10. Type of cargo.

Within the area, vessels must follow instructions from the Control Center. Permission must be obtained prior to anchoring.

Radar surveillance is maintained between Cayo Arcas and Dos Bocas and in their approaches. Vessels will be guided as needed within the radar surveillance area. Control Centers also serve as information centers for the area.

Caution.—Offshore oilfields are being extensively developed in the Bay of Campeche. Mobile drilling rigs, platforms, and associated structures, sometimes unlit, may be encountered anywhere in the area. Numerous submarine pipelines, many uncharted, exist within the oilfields and between them and the shore.

Most of the platforms are in a specific Area to be Avoided, whose boundaries are best seen on the chart. A storage tanker is moored NNE of the NE boundary of the area.

A major offshore oilfield is situated between 40 miles and 58 miles SSW of Cayo Arcas. Several production platforms, interconnected by submarine pipelines, are situated throughout this area. A submarine pipeline extends SW between the central platform (19°24'N., 92°02'W.) and a terminal on the coast at Barra de dos Bocas. Ship movements in the area are controlled by a Maritime Controller on a 24-hour basis. Vessels planning to enter the area should report to the Maritime Controller by VHF channel 16 and comply with the Maritime Controller's directions.

7.13 The depths seaward of the 20m curve have been previously described. The depths within this curve, which lies up to 35 miles offshore, are irregular. The coastal bank, as defined by the 5m curve, extends up to 12 miles offshore between Punta Boxcohuo and Champoton, which is described in [paragraph 7.15](#).

Bancos de Champoton (19°23'N., 90°50'W.), a group of detached patches with depths of 4.3 to 8.2m, extends 10 to 15 miles W from Champoton.

Bancos de Sabancuy (19°10'N., 91°16'W.), a group of patches with depths of 4.3 to 9.1m, lies 32 miles SW of Champoton and extends up to 12 miles offshore.

Between Punta Boxcohuo and Celestun, the coast is low and sandy. Two shoal patches, with depths of 8.2m and 9.1m, lie about 16 miles W of Celestun.

There is seldom any current off the W side of Peninsula de Yucatan.

During the rainy season, from June to September, squalls develop at times with considerable force.

The prevailing winds are from directions between the NE and SE.

Real de Las Salinas (20°45'N., 90°26'W.), the W entrance to the lagoon which parallels the N coast of Peninsula de Yucatan, lies 6 miles S of Celestun.

Between Real de Las Salinas and Campeche, 55 miles to the S, the low coast is bordered by swampy ground for about 25 miles and then becomes more elevated, rising to heights of 30 to 85m N of Campeche. Isla de Piedras, 9m high, stands close offshore, 23 miles N of Campeche.

7.14 Campeche (19°51'N., 90°33'W.) ([World Port Index No. 9500](#)), the capital of the state of Campeche, stands on a plain bordered on three sides by a small amphitheater of hills. Fort San Jose stands on the NE outskirts of the city and Fort San Miguel stands on the SW perimeter of the city. The city serves as the distributing point for the W coast of Peninsula de Yucatan. Sisal is the principal export. Port facilities are located at the town of Lerma, 3.5 miles SW of Campeche.

Depths—Limitations.—Vessels are restricted to a maximum draft of 10m and must stay in the channel due to sandbars in the port approach. A lighted range, in line bearing 139°, leads into the port. The seaward safe water buoy marking the range has been reported missing (2001).

Muelle Castillo Breton, a pier about 500m long, with a depth of 3.6m alongside, extends from the village of Lerma, 3.5 miles SW of Campeche. The pier has 213m of berthing space at its outer end, 122m of which is reserved for local fishing vessels.

Muelle Fiscal (Muelle Pemex) is 521m long and has a depth of 5.1m alongside.

Muelle Unidad Pesquera has a depth of 4.2m alongside and is used exclusively by fishing vessels.

Puerto de Abrigo is situated 0.3 mile SE of Muelle Castillo Breton; there is a small pier about 0.3 mile NE of the same jetty.

Pilotage.—Pilotage is compulsory for vessels berthing alongside.

Signals.—A signal station is situated atop Fort San Jose NE of Campeche light. A blue flag indicates threatening weather while a red flag indicates that the port is closed.

Anchorage.—Anchorage can be taken, in a depth of 6.4m, about 11.8 miles W of Campeche. This anchorage is not so subject to the effects of northers as are other gulf ports.

Caution.—Vessels approaching the anchorage should note that dangerous wrecks lie 10 miles NW and 18 miles W of Punta Mastun.

7.15 Between Campeche and Punta Mastun Grande, a wooded, 129m high headland about 9 miles SW, and Punta Morro, 5 miles farther SSW, the coast is bold and backed by ridges of hills.

Between Punta Morro and the Rio Champoton, 20 miles S, the coast is backed by a ridge of hills that are more broken than those to the N. The ridge terminates in a prominent, 110m high hill about 8 miles S of the river.

Champoton (19°22'N., 90°43'W.), a small village, stands on the S side of the entrance to the Rio Champoton. An old fort and two churches stand in the town. Observation Cay, 1.5m high, lies close off the river entrance.

The river is entered passing S of Observation Cay, a rocky islet which lies 0.2 mile off the mouth of the river. There is a depth of 0.9m over the bar and depths of 6 to 7m inside the river.

Between the Rio Champoton and Barra de Puerto Real, 55 miles SW, the low, wooded coast is fronted by a continuous stretch of sandy beach. Numerous sand and shell patches, with depths of 2.4 to 5.5m, lie up to 5 miles off this section of coast.

Barra de Puerto Real (18°47'N., 91°30'W.), the E entrance to Laguna de Terminos, is 2 miles wide and has depths of 1.8 to 3.7m. A pair of lighted beacons, in line bearing 151°, stand on Punta del Tigre on the N side of the entrance. A shallow, breaking spit extends 2.5 miles WNW from the point. A channel for vessels with drafts of less than 3m leads to an anchorage off Punta del Tigre, but should not be attempted without local knowledge. A road connects Isla Aguada on the E side of the entrance with the coast SE of Puerto Real on the W side.

Isla del Carmen, low and sparsely wooded, fronts Laguna de Terminos between Barra de Puerto Real and Barra Principal, the W entrance of the lagoon, lying 20 miles WSW.

7.16 Ciudad del Carmen (18°39'N., 91°50'W.) ([World Port Index No. 9490](#)) consists of numerous jetties and wharves which project from the W shore of the town. There is a dredged fishing vessel haven to the N of the jetties. A naval base is situated to the S of the harbor.

Depths—Limitations.—The Fiscal Berth, 350m long, has an alongside depth of 3.7m and is used mainly by offshore petroleum companies.

Barra Principal is 6 miles wide between Punta Vigia, 0.5 mile SE of the SW end of Isla del Carmen, and Punta Xicalango, on the opposite side of the entrance. A breaking spit extends 4.5 miles NW from Punta Vigia and depths of 1.8 to 3.7m extend 3 miles N from Punta Xicalango. A buoyed channel, with depths of 3.7 to 4.3m, leads through these shoals to the town of Ciudad del Carmen, on the SE side of Punta Vigia. A rock bar in the channel limits the size of vessels using the port to a draft of 3.7m.

Aspect.—Two lighted beacons, in line bearing 180°, stand on the W side of the entrance and indicate the fairway of this channel.

Pilotage.—Pilotage is compulsory.

Anchorage.—Good anchorage can be taken, in depths of 7 to 9m, about 8 miles NNW of Punta Vigia. The mud bottom is good holding ground, but this anchorage is not safe during the season of the northers.

Secure anchorage can be taken off the town in depths of 9 to 11.9m, keeping clear of the approach to the wharves. Anchorage is also recommended 6 miles N of Punta Vigia, in a depth of 4.9m.

Between Barra Principal and the Rio Grijalva, 46 miles W, the coast is low and has no prominent features.

Caution.—Considerable changes to depths, navigational aids, and the coastline have taken place in the approaches to Ciudad del Carmen. The most recent editions of appropriate charts should be consulted.

Punta Buey to Punta Zapotitlan

7.17 Punta Buey (18°39'N., 92°43'W.) is a low point which has been reported to be extending N and NW. Depths of 5.5 to 7.3m extend about 1.5 miles N and NW from the point.

The coast recedes 8 miles SW from Punta Buey, then extends in a general WSW direction for a distance of 95 miles to Coatzacoalcos, then W for 10 miles and then NNW for an additional 25 miles to Punta Zapotitlan. This low, marshy coast is indented by several lagoons and is covered with very heavy vegetation, except in the tidal marshes. Several rivers discharge into the gulf, and hills stand 3 to 8 miles inland on the W part of this coast.

The 20m curve lies 7 miles NW of Punta Buey and extends along the coast 2 to 4 miles offshore. With the exception of a shoal, with a least depth of 7.9m, which lies 5 miles NW of the mouth of the Rio Coatzacoalcos, there are no known off-lying dangers.

From October to March, the current near the shore sets E at a rate of 1 to 1.5 knots.

The winds tend to blow from the N. Northerly occur at about 8 day intervals between October and March.

7.18 Frontera (Alvaro Obregon) (18°35'N., 92°39'W.) (World Port Index No. 9440) stands on the E bank of the Rio Grijalva, 5 miles S of the entrance. The port is used mainly by small coastal vessels.

Tides—Currents.—There is only one tidal rise every 24 hours. The tidal rise is 0.6 to 1.2m at springs.

When the river is at its highest level, the bar has the least depth over it; and when it is at its lowest, the channel being contracted, is flushed out and becomes deeper. At the end of the rainy season in December, the least depths may be expected, but the first northerly will increase the depth by about 0.9m and again a freshet may reduce it by a similar amount.

Depths—Limitations.—Depths of less than 5m extend 0.8 mile N and 1 mile NW from the E entrance point, and similar depths extend 1.5 miles N and 0.5 mile W from Punta Buey. The bar, which lies N of the entrance points, has been reported dredged to a depth of 4.6m. The buoyed channel within the river has a navigable width of about 230m with depths of 3.7 to 4.9m. The preferred channel passes E of Isla Buey, about 3 miles S of the entrance.

Grijalva Canal, which crosses the peninsula S of Punta Buey, was a former river entrance, but is no longer used.

Fiscal Wharf, which parallels the shore abreast the town, is 300m long and has a depth of 5.5m alongside. Vessels with drafts up to 4.6m have entered the port.

Pilotage.—Pilotage is compulsory. Pilots are summoned from the lighthouse for vessels arriving before 2200. At least 1 hour is required for the pilot launch to go from the town to the anchorage off the canal entrance.

Anchorage.—Anchorage can be taken, in depths of 7 to 9m, seaward of the bar. On the approach of a northerly, vessels should proceed to sea until it has passed.

Anchorage may be obtained off the W entrance to Grijalva canal. Care must be taken to avoid the wrecks in the vicinity.

Anchorage can be taken in the river off the town. Anchorage berths are allocated by the port authorities.

Caution.—An overhead cable, with a vertical clearance of 36m, spans the river close N of Frontera.

7.19 Between Punta Buey and Coatzacoalcos, 100 miles WSW, the coast is low, fairly steep-to, and bordered by mangroves and palm trees.

The **Rio Gonzalez** (18°26'N., 93°04'W.), 23 miles SW of Punta Buey, is a shallow river. It can be navigated by light-draft vessels up to 90 miles inland. Barra de Chiltepec, marked by a light, is the E entrance of this river and has the village of Chiltepec on its W entrance point. Small coastal vessels frequent this port, but a local pilot is necessary.

Barra de Dos Bocas, the entrance leading into a lagoon, lies 3.5 miles W of the Rio Gonzalez.

A dangerous wreck lies about 9 miles NE of Barra de Dos Bocas.

7.20 Dos Bocas Terminal (18°25'N., 93°08'W.), situated 5 miles W of Chiltepec Light, lies at the SW end of the submarine pipeline extending from the marine oil field.

Depths—Limitations.—At the terminal there is a berth 1,100m long, with a maximum alongside depth of 5.2m. Two SPM moorings for tankers up to 250,000 dwt are situated in depths of 22m, about 11 miles N of the terminal. Submarine pipelines extend S from the mooring buoys to the shore.

Pilotage.—Pilotage is compulsory. Pilots are available from 0800 to 1800, Monday to Saturday, and from 0800 to 1200 on Sunday. Vessels should send ETA 72 hour, 48 hour, and 24 hours in advance of arrival. Any change of ETA of more than 12 hours should be reported. Pilots board 2 miles N or NW of the tanker SPM buoys.

Anchorage.—An anchorage for vessels waiting to berth is centered in 18°45.2'N, 93°10.5'W, 7 miles N of the tanker anchorage.

Anchoring is prohibited within an area shown on the chart enclosing the moorings and submarine pipelines.

7.21 Barra de Tupilco (18°26'N., 93°25'W.), a shallow entrance leading into a lagoon, lies 16 miles W of Barra de Dos Bocas. A disused tower stands on the E side of the entrance.

Laguna del Carmen, a lagoon, lies 26 miles W of Barra de Tupilco. A rock, awash, was reported (1976) to lie 17 miles NNW of Laguna del Carmen.

The **Rio Tonala** (18°13'N., 94°08'W.), with depths of 2.4 to 3m on the bar at its entrance, lies 16 miles W of Laguna del Carmen. Each river entrance point is marked by a conspicuous sand hill. A light is shown from the W entrance. Small vessels with drafts up to 2.4m can enter the river, but local knowledge is necessary. Vessels anchor within the above-mentioned rivers to load mahogany.

An SPM buoy is reported to be situated about 3 miles NE of Coatzacoalcos harbor entrance.

Coatzacoalcos (18°08'N., 94°25'W.)

World Port Index No. 9405

7.22 Coatzacoalcos, formerly known as Puerto Mexico, stands on the W bank of the Rio Coatzacoalcos, close within the entrance, and is a first port of entry. The free port stands on the same side of the river, S of the town. On the E side of the entrance is a round hill. The town, with its buildings and radio towers, is prominent from seaward. Low land fronts the hills on either side. Approaching from seaward, several high dark green hills will be observed E of the entrance. Some low sandhills appear W of the entrance, the tops of which are covered with

green vegetation. The water is muddy for about 1.5 miles outside the heads of the breakwater. The breakwaters are conspicuous. The E side of the river mouth is radar conspicuous at 40 miles.

Winds—Weather.—The port of Coatzacoalcos is occasionally closed, in some cases for 2 or 3 days, during strong northers, which generally occur from November to March. These storms can raise the water level considerably in the port.

Tides—Currents.—Strong currents may be encountered in the vicinity of the port.

Depths—Limitations.—The maximum allowable draft of vessels crossing the entrance bar is 11.3m. It was reported that the depths over the bar were liable to decrease considerably because of unusually strong currents setting to the W, but more so when the river is flooding, from June to October, when both currents are strong.

The approach channel from the entrance to Darsena de Pajaritos is dredged to a depth of 14m over a width of 100m. The channel leading to the Rio Coatzacoalcos is 200m wide and dredged to a depth of 10m.

A wharf, about 1,943m long with depths of 6.4 to 9.7m alongside, borders the W bank of the river abreast of Coatzacoalcos. The wharf consists of nine alongside berths for handling cargo. The largest berth is 190m long and has a depth alongside of 9.7m.

There are also 14 tanker berths. The largest can handle vessels up to 200,000 dwt, 250m in length, and 12.8m draft.

Pilotage.—Pilotage is compulsory. Vessels may contact the pilot on VHF channels 10, 11, 14, and 16. Vessels should send an ETA 24 hours prior to arrival. The pilot will meet the vessel 2 miles N of the breakwater; during foul weather the pilot will meet the vessel inside the breakwater.

Pilotage for vessels up to 220m in length is available 24 hours. Pilotage for vessels over 220m in length is available only from 0600 to 1700.

Caution.—Because of the strong currents, all vessels of 2,500 grt or greater are required to employ a tug for berthing, undocking, or maneuvering within the limits of the harbor.

7.23 Pajaritos (18°09'N., 94°25'W.) ([World Port Index No. 9400](#)) consists of the Pemex Wharves, which are composed of four concrete finger piers, with a berth on either side. These piers are situated within the SW part of Darsena de Pajaritos.

Tides—Currents.—Offshore, the current sets NW, but near the breakwaters it sets E. The current in the river varies with the stage of the tide, attaining its maximum rate of 5 to 5.5 knots about 2 hours after HW. During the first 3 hours of the flood, the rate ranges from 2.5 to 3 knots. The rise of the tide is about 0.6m.

Depths—Limitations.—In the approach to the port, depths of 16m are encountered within 1 mile N of the breakwater heads. They shoal gradually to general depths of 9 to 10.4m, between the breakwaters and the navigable channel within the river.

The channel leading to the existing berths and the turning basin is dredged to a depth of 14m at MLW.

In the E part of Darsena de Pajaritos there is a quay, 425m long. Vessels up to 35,000 grt and 10m draft can be accommodated.

Pilotage.—Pilotage is compulsory. The pilot boat will meet vessels 0.5 to 3 miles off the breakwater. A vessel should not approach the breakwaters too closely, due to the strong currents which set across the entrance.

Pilotage for vessels up to 220m long is available 24 hours. Pilotage for vessels over 220m long is available only from 0600 to 1700.

An ETA should be sent soon after departure from the last port of call but at least 24 hours before arrival.

Anchorage.—The anchorage areas in the vicinity of the port may best be seen on the chart. It was reported that the holding ground in the anchorages was poor and during a N wind most vessels dragged their anchors.

Two anchorage areas, designated E and W, have been established for vessels both entering and sailing from Coatzacoalcos and Pajaritos, and for vessels operating at the SPM buoy.

Directions.—The landfall should be made E of the river entrance because the current usually sets to the W or NW. At times, an E current has been observed near the breakwater heads. By day, the town can be identified by the smoke over it, and at night by the glare of the lights. Having sighted the lights on the heads of the breakwaters, a vessel should steer for a position about 1.5 miles NNW of the breakwaters. From this position, the lighted range beacons should be brought to bear 162°, which leads through the entrance channel. Care should be taken to strictly adhere to this alignment because the depths shoal in places a short distance from it. The edges of the channel are defined by range beacons. When abeam of the ferry landing on the E bank of the river, course may be altered as required for the desired berth.

7.24 Nanchital, Concepcion, and Minatitlan, all oil-loading facilities, lie upriver from Coatzacoalcos. A bridge spans the Rio Coatzacoalcos about 2.8 miles from the entrance. It has a central lifting span which is opened for traffic at 1100 daily for about 1 hour.

Nanchital (18°04'N., 94°25'W.) ([World Port Index No. 9410](#)) is situated 6.5 miles above the river entrance, on the E bank of the Rio Coatzacoalcos. The river channel is available for vessels with drafts up to 8.2m. The port has two T-headed piers, with depths of 8 to 9m alongside and a marginal quay, 239m long, with a depth of 8m alongside. A tug usually accompanies vessels proceeding to Nanchital as far as the Coatzacoalcos Bridge.

The maximum vertical clearance is 29.9m due to the height of the bridge. Vessels are able to turn a little beyond this port, where the river is about 140m wide and has a dredged depth of 10.7m. Vessels up to 177m in length and 8.4m draft can be handled.

Concepcion (17°37'N., 92°49'W.) ([World Port Index No. 9430](#)), a similar oil-loading facility, stands on the Rio Uspanapa, 24 miles above its junction with the Rio Coatzacoalcos, which is 3 miles above Nanchital. Vessels up to 91.4m in length and 4.7m draft can be accommodated.

Minatitlan (18°00'N., 94°32'W.) ([World Port Index No. 9420](#)), 14 miles above Nanchital, is the site of an oil refinery.

Depths—Limitations.—There are several T-head piers available. There is a turning basin, 850m long and 190m wide, which has depths of 7 to 11m.

Vessels proceeding to Minatitlan unload at Nanchital until their draft is reduced to 6.4m, then proceed to Minatitlan to discharge the remainder of their cargo; the reverse procedure is used when loading and outbound.

Vessels up to 145m in length and 6.4m draft can be handled.

Pilotage.—Pilotage is compulsory. The pilot boards off the entrance to Coatzacoalcos.

7.25 Between Coatzacoalcos and the Rio Barilla, about 12 miles W, the coast is low and unvaried.

The Rio Barilla is the entrance of a lagoon which is connected to Coatzacoalcos by a river S of the city.

Punta San Juan (18°17'N., 94°37'W.), 5 miles N of the Rio Barilla, has a small islet lying close off it.

Between Punta San Juan and Punta Zapotitlan, 20 miles NNW, the coast is backed by mountain ranges rising 3 to 8 miles inland. Cerro San Martin, conspicuous from seaward, stands 8 miles inland W of Punta San Juan.

Punta Zapotitlan to Cabo Rojo

7.26 Punta Zapotitlan (18°33'N., 94°48'W.), marked by a light, is a prominent point bordered by a reef which extends 0.5 mile offshore. A 21.9m shoal patch was reported (1950) to lie about 13 miles NNE of the point.

An old disused lighthouse stands near the light structure on the point.

The coast between Punta Zapotitlan and Cabo Rojo extends in a general NW direction for 230 miles. Mountain ranges, with some conspicuous peaks, back the coastal plain. The more prominent coastal features and dangers are lighted. Numerous islets, shoals, and other dangers lie off this section of coast.

7.27 Arrecife Santiaguillo (19°09'N., 95°48'W.), 2m high, lies 11 miles ENE of Punta Coyal, at the NE end of a group of reefs. The reef is marked by a light with a racon.

Arrecife Anegadilla, the outermost reef of the group lying off Punta Coyal, is located 0.5 mile ESE of Arrecife Santiaguillo.

Arrecife Anegada de Afuera (19°09'N., 95°51'W.), 2.5 miles long, lies about 1.5 miles WNW of Arrecife Santiaguillo. A small reef with a cay, Isla Topatillo, on it close, off its S end, is located on Arrecife Anegada de Afuera.

Arrecife Cabeza, 3.5 miles long and 1.5 miles wide, lies 4 miles SSW of Arrecife Santiaguillo. Lights are shown from the NW and SE extremities of the reef. The passages E and W of this reef have depths of 29 to 36.6m.

Arrecife de Enmedio, with shoal patches close off its W side and a small reef and another patch close off its N end, lies 3.5 miles NE of Punta Coyal. A small cay, marked by a light, lies on the S end of the reef.

Arrecife Rizo, 1.5 miles long, lies 1.5 miles SSE of Arrecife de Enmedio. A spit, with a depth of 2m over its outer end, extends a little more than 0.5 mile N from the N extremity of Arrecife Rizo. A light marks the SE extremity of the reef.

Arrecife Chopas (19°05'N., 95°58'W.), 3.3 miles long, lies 2 miles N of Punta Coyal. A small reef lies close S Isla Salmedina, a grass-covered cay, on the S end of the reef. Several small reefs lie close off the N and NW ends.

Arrecife Blanca, 0.3 mile in extent with a small cay on it, lies 1 mile W of Arrecife Chopas.

Vessels without local knowledge should not attempt the passages between Arrecife Rizo, Arrecife de Enmedio, and Arrecife Chopas. Foul ground lies in the passage between Arrecife Chopas and Arrecife Blanca. This passage should not be used.

Caution.—An Area to be Avoided, the limits of which may best be seen on the chart, has been established around the reefs in order to protect the National Marine Park, including the Reef System of Veracruz, from the risk of pollution. All vessels greater than 500 grt and all vessels carrying oil, chemicals, toxic cargo, or nuclear cargo should avoid this area.

The group of reefs which lie in the approach to Puerto Veracruz are described under the principal description of that port in [paragraph 7.33](#).

7.28 Bajo Blake (20°45'N., 96°58'W.), a shoal with a depth of 9m, lies 13 miles SE of Punta de Piedras.

An obstruction was reported (1923) to lie about 13 miles ENE of Punta de Piedras. A depth of 7m was reported (1967) to lie the same distance ESE of the same point. The existence of the 8.9m shoal reported to lie 18 miles NE of Punta de Piedras is doubtful. A depth of 7.5m lies 3.3 miles NNW of Bajo Blake.

Arrecife Tuxpan (21°01'N., 97°12'W.), a small steep-to reef with a low cay on it, lies 6 miles ENE of the Rio de Tuxpan. A light, with a racon, is shown on the S side of the reef.

Arrecife Enmedio, a small reef, lies 3 miles NW of Arrecife Tuxpan.

Arrecife Tanguijo, a small steep-to drying reef, lies 7 miles NW of Arrecife Tuxpan. A light is shown from the NW part of the reef. The passages between the above reefs are clear of any known dangers.

Isla Lobos (21°28'N., 97°13'W.), a small islet 9m high, lies 9 miles SE of Cabo Rojo. A reef extends 1 mile N from it. A light, with a racon, is shown from the SW tip of the island.

Arrecife Medio, a small steep-to reef marked by a light, lies 3 miles NW of Isla Lobos Light.

Arrecife Blanquilla, a breaking reef with a drying sandbank on it, lies 6 miles NW of Isla Lobos. A light stands on the reef.

The passages between the above reefs have depths of 17.4 to 51m, but the passage between Arrecife Blanquilla and the coast near **Cabo Rojo** (21°33'N., 97°20'W.) is of doubtful safety, as the soundings are irregular.

The currents off this coast are variable, uncertain, and usually dependent on the force and direction of the wind.

The coastal current usually sets S in the winter and N in the summer.

The trade winds blow from NE to ESE. After the season of the northers, from October to March, there are light N breezes, calms, squally rains, and intermittent thick weather up to the middle of August, when the trades resume again.

7.29 Between Punta Zapotitlan and Alvarado, 56 miles WNW, the first 33 miles of coast is backed by ranges of hills rising 3 to 8 miles inland. The remaining part of the coast is lower, being composed of sand hills 15 to 61m high.

Barra Sontecomapan, a bar with a depth of 1.8m, obstructs the entrance of Laguna Sontecomapan, 10 miles W of Punta

Zapotitlan. The entrance may be identified by a conspicuous umbrella-shaped tree which stands on a bluff a little to the W of it.

Punta El Barco, a bold, rounded bluff, rises 15 miles WNW of Punta Zapotitlan.

Punta Roca Partida (18°42'N., 95°11'W.), marked by a light, consists of perpendicular cliffs located 8 miles WNW of Punta El Barco. A rocky islet lies close off the point.

Volcan San Martin (18°33'N., 95°12'W.), 10 miles S of Punta Roca Partida, is a 1,650m high volcano, which can be readily distinguished from a great distance in clear weather. When active, the column of smoke by day and the flames at night make this volcano an excellent landmark.

7.30 Alvarado (18°47'N., 95°46'W.) ([World Port Index No. 9390](#)), primarily a fishing port, lies within the entrance of a lagoon of the same name lying 32 miles WNW of Punta Roca Partida.

Depths—Limitations.—A shoal, with a least depth of 4.2m, lies 1.7 miles N of the E entrance point. Two patches, with depths of 2.4m and 2.1m, lie in mid-channel, about 0.3 mile NW and 0.8 mile SSW, respectively, of the E entrance point.

The bar is located about 0.5 mile outside the entrance points; it is constantly shifting and the sea nearly always breaks on it.

The river is navigable by vessels having drafts less than 3m for a distance of 24 miles upriver.

In 1985, a depth of 8m was reported over the bar.

Aspect.—A conspicuous sandy bluff and a beacon stand on the E entrance point. A beacon stands on the W entrance point.

Pilotage.—Pilotage is compulsory.

Anchorage.—Anchorage can be taken, in depths of 18 to 22m, about 2.5 miles seaward of the bar, but it is not safe during the winter or in the season of the northers. Anchorage can also be taken, in depths of 5.5 to 11m, off Alvarado.

7.31 The coast between Alvarado and Punta Coyol, 20 miles NW, is bordered by two large lagoons along its S half and by low land along its NW half.

Punta Coyol (19°03'N., 95°58'W.) is a blunt point composed of low sand hills. An 80m high sand hill rises 3 miles W of the point. The village of Anton Lizardo stands on the N side of the point.

Arrecife El Giote extends 0.8 mile from the coast close W of Anton Lizardo.

Anton Lizardo Anchorage (19°04'N., 95°59'W.), lying between Arrecife Chopas and Punta Coyol, has depths of 12.8 to 20m, sand and mud, and provides protection from the northers. The reefs NE of Punta Coyol have been previously described in [paragraph 7.27](#).

Directions.—During the winter months, there is frequently a haze which obscures the land until near the reefs. Under such conditions, it is safer to make the land to the W, where it is bold and clear of dangers, and proceed to the anchorage through the W channel.

Under ordinary conditions, the reefs are marked and there is no difficulty in entering from either the E or W. A vessel having sighted Arrecife Santiaguillo Light, if approaching from the NE, should steer to pass about 2 miles E of it; after having passed E and S of Arrecife Cabeza, a course should

then be steered to pass about 0.8 mile S of Arrecife Rizo Light. When Isla Blanca Light bears 299°, it should be steered for on that bearing and anchorage taken as convenient. Care should be taken to avoid the 10.4m patch about 1.5 miles S of Arrecife Cabeza and the 9.8m patch lying 1.8 miles SSE of Isleta Salmedina.

A vessel approaching from the N should steer to pass at least 1 mile E of Arrecife Anegada de la Adentro and round Isla Blanca at a distance of 0.5 mile. When Arrecife Rizo Light bears 107°, it should be steered for on that bearing and anchorage taken as convenient.

Between Punta Coyol and Punta Mocambo, 9 miles NW, the coast recedes 2 miles to form a sandy bay bordered by low sand hills. A reef lies about 0.8 mile SE of Punta Mocambo. The Rio Jamapa, with depths of 0.9 to 1.8m over the bar, discharges into the gulf 2.5 miles S of Punta Mocambo.

The coast between Punta Mocambo and Puerto Veracruz, 4 miles NW, is low and sandy.

7.32 The steep-to reefs in the approach to Puerto Veracruz break and are easily identified in clear weather from aloft.

Arrecife Anegada de Adentro (19°14'N., 96°04'W.), the outermost reef, is 1 mile long, 0.3 mile wide, and lies 4 miles ENE of the harbor entrance. Two shoal patches, with depths of 7.8 to 9.6m, lie within about 0.3 mile of the SW edge of the reef.

It was reported (1994) that a conspicuous wreck lies on the S end of the reef. Another wreck is reported to lie about 0.6 mile NW of the conspicuous wreck.

Isla Verde, a low white cay marked by a light, stands on the S end of a reef lying 1.5 miles SSW of Arrecife Anegada de Adentro. The intervening channel is about 1 mile wide and has depths of 25 to 36m.

Bajo Paducah (19°12'N., 96°05'W.), a shoal with a least depth of 8.9m, lies about 0.3 mile W of the N end of the reef on which Isla Verde lies.

Arrecife de Pajaros, 1 mile long, lies 1.3 mile WSW of Isla Verde. A light is displayed from the NW tip of the reef. The intervening channel has depths of 20 to 29m.

Isla de Sacrificios, a small cay, lies on the S end of a reef close S of Arrecife de Pajaros. A light, with a racon, is shown from the island. The passage between Isla de Sacrificios and Arrecife de Pajaros is narrow and foul.

Bajo Mersey (19°11'N., 96°06'W.), with a least depth of 4.5m, lies 0.8 mile NW of Isla de Sacrificios. Shoals with a least depth of a little over 6m, extend up to about 0.3 mile NW from Bajo Mersey.

Arrecife Blanquilla, 0.5 mile in extent, lies 1.8 miles W of Arrecife Anegada de Adentro. Two shoal patches, with depths of 15m and 16m, lie about 0.8 mile WNW and 1 mile NW, respectively, of Arrecife Blanquilla. A 9.7m shoal patch lies 0.5 mile E of the root of the NE breakwater. The channel between Arrecife Blanquilla and Arrecife Anegada de Adentro is 1.5 miles wide and has depths of 16 to 40m. The channel W of Arrecife Blanquilla is about 0.8 mile wide and has depths of 18 to 31m.

Arrecife La Gallega extends 1.3 miles N from the N side of the harbor. Arrecife Galleguilla, marked by a light, lies close NE of its N end.

Arrecife Hornos extends about 0.3 mile E from the root of SE breakwater.

Puerto Veracruz (19°12'N., 96°08'W.)

World Port Index No. 9380

7.33 Puerto Veracruz, one of the principal ports of Mexico and a port of entry, is an artificial harbor protected on three sides by breakwaters. Ample berthing facilities are provided for all classes of vessels.

Winds—Weather.—With the exception of the land breezes at night, the winds usually blow from seaward and are heavily saturated with moisture causing a high humidity rate. March and April are the least humid months.

Offshore, the trade winds blow from NE to the ESE. During the season of the northers, from October to March, winds up to 50 knots occur, making it impossible for vessels to enter the harbor. After April, there are light N winds, calms, squalls, and unsettled weather until about the middle of August, when the trades again resume.

Land and sea breezes regularly alternate, even in the intervals between the northers. The former begins shortly after sunset and the latter at 0900 hours.

Tides—Currents.—The diurnal range of the tide is 0.5m. The water level is appreciably influenced by the force and direction of the wind.

The tidal currents are weak and are overcome by the coastal currents which are also affected by the winds. During the winter, the current usually sets S and in the opposite direction during the summer.

Depths—Limitations.—In normal weather conditions, there are no restrictions on entry or departure. The sole consideration is the draft of the vessel since, if the draft exceeds 8.8m, the time of the tide must be considered; after a strong N wind, a vessel with a draft of more than 7.3m must wait for the tide. The access channel has depths of 10 to 12m.

In the basin formed by the above reefs, the depths range from 18 to 40m. The 20m curve lies 0.8 mile off the harbor entrance, with the depths shoaling gradually to a depth of 10.5m between the breakwater heads. There are general depths within the harbor of 7.3 to 9.1m, with depths of 7.3 to 11m alongside the wharves and piers. Considerable silting has taken place within the harbor and only vessels with a maximum draft of 9m are able to enter.

Several piers are available and have depths of 9 to 10m alongside. Muelle No. 1, Muelle No. 2, and Muelle No. 6 are 360 to 724m long. They have depths alongside of 10m and can accommodate container and bulk vessels. Muelle No. 4 is a bulk cargo berth and has a depth alongside of 9.1m.

Berth No. 7 accommodates general, container, and ro-ro cargo and has an alongside depth of 9.4m.

The cement wharf is 365m long and has an alongside depth of 9.4m.

The aluminum wharf is 180m long and has an alongside depth of 10m.

The grain wharf is 185m long and has an alongside depth of 9.4m.

The container terminal is 340m long and has an alongside depth of 9.4m.

The molasses wharf is 90m long and has an alongside depth of 9.4m.

The Astillero Wharf is 1,129m long and has an alongside depth of 9.4m.

Additional berths with shallower depths are available for small coastal vessels and fishing craft.

Aspect.—Volcan Citaltepet (Pico de Orizaba), 5,303m high, rises 63 miles W of the city. This inactive volcano has a crater 3.5 miles in circumference, which can easily be distinguished from a considerable distance on a clear day.

Cerro Nauhcampatepetl, 4,280m high, is located 25 miles NNE of the above volcano and has a peculiar shape. Snow falls on isolated spots at elevations of 3,650m or greater.

A prominent high radio tower stands 0.8 mile S of the root of the SE breakwater.

Pilotage.—Pilotage is compulsory, but is available only from 0800 to 1800. Vessels should send their ETA 24 hours in advance, via the agent, stating vessel name, flag, and draft. Pilotage should be ordered through the agent at least 2 hours in advance. The pilot boards 3 miles E of Isla Verde. Berthing, shifting berth, or anchoring within the harbor must be done under the supervision of a pilot.

Regulations.—A Traffic Separation Scheme (TSS) has been established in the approaches to Veracruz. In normal weather, there are no restrictions on entry or departure, the sole consideration being the draft of the vessel. If the vessel has a draft of more than 8.8m, the tide must be taken into consideration. After a strong N wind, a vessel with a draft of more than 7.3m must wait for the tide.

Anchoring in the main channel or the harbor entrance is prohibited. All ship movements within the harbor require permission from the captain of the port. Vessels must give advance notice if wishing to enter the harbor at night.

Vessels over 2,500 grt require a tug for maneuvering within the harbor.

Anchorage.—Vessels anchor in a designated area, the limits of which may best be seen on the chart, situated ESE of Veracruz.

Directions.—To enter the harbor, the cathedral dome about 0.4 mile WSW of Benito Juarez tower should be steered for on a heading of 261°; at night, the light on the head of Muro de Pescadores bearing 270, until the light on the E corner of Muelle de La Terminal bears 290°, leads through the entrance in mid-channel between the breakwater heads. A course can then be steered for the anchorage.

7.34 Between Arrecife La Gallega, which extends N from Puerto Veracruz, and Punta Gorda, 3 miles NW, the coast recedes 2 miles forming Bahia de Veragua.

From Punta Gorda, the coast extends 6.8 miles WNW to Punta Antigua, on the S side of the entrance to the Rio de La Antigua, and then 9.5 miles to Punta Zempoala. Punta Antigua has been reported to be radar conspicuous.

Bajo Zempoala, with depths of 4.9 to 7.9m, lies 4 miles N of Punta Zempoala and 2 miles offshore.

Between Punta Zempoala and Punta del Morro, 25 miles NNW, the coast has several reef-fringed points and is marked by several conspicuous peaks.

Pico Zempoala (19°33'N., 96°27'W.), the S peak, is 701m high and stands about 10 miles NW of Punta Zempoala. Los



Dos Antriscos, a peak 799m high, rises 5 miles SW of Punta del Morro. A bare chimney rock, 267m high and prominent, is located 2 miles WNW of Punta Penon, which lies 9 miles NNW of Punta Zempoala.

Isla Bernal Chico (19°40'N., 96°23'W.), 44m high, lies close offshore, 12 miles NNW of Punta Zempoala. A prominent bare rocky hill, over 90m high, stands on the coast 1.8 miles WSW of this island.

The coast between Punta Gorda and the Rio Nautla, 30 miles NW, and the Rio Tecolutla lying 18 miles farther NW, is fronted by a narrow, thickly-wooded strip of land paralleled by a narrow lagoon. A range of hills rises 5 miles inland.

Dos Hermanos (20°06'N., 96°52'W.), a conspicuous peak, rises to an elevation of 357m about 9 miles SSW of the Rio Nautla. Cerro Burras stands about 9 miles SW of the Rio Tecolutla. A dangerous wreck lies 4 miles E of the N side of the mouth of the Rio Tecolutla.

Between the Rio Tecolutla and Punta de Piedras, a reef-fringed point located 25 miles NW, several rivers discharge into the gulf from the lagoon which backs the coast.

Between Punta de Piedras and the Rio Tuxpan, 9 miles NW, the coast is 30m high.

7.35 The Rio Tuxpan (20°58'N., 97°19'W.) has a maximum depth of 4.9m over the bar and is fronted by breakwaters which extend 0.3 mile offshore from the entrance points. Within the bar, the depths increase considerably. The least depth, as far as the town of Tuxpan, is 2.7m. Vessels with drafts up to 2.1m can proceed as far as 36 miles above the entrance.

Depths—Limitations.—Situated 5 miles above the entrance to the river, Tuxpan has a Fiscal Wharf, 160m long, with a depth of 4.9m alongside. There are two additional wharves, 17m and 70m long, with depths of 4.9m alongside.

On the S side of the river, 3 miles upstream of the entrance, there is a petroleum pier, with a depth of 8.3m alongside.

SPM No. 1 is moored 4 miles ENE of the Rio Tuxpan North Entrance Light. SPM No. 2 is moored 4 miles NE of the same light. SPM No. 3 is moored about 1 mile N of Bajo de Tanguijo.

Aspect.—Several tall stacks and oil tanks standing on the banks of the river are conspicuous from seaward.

Pilotage.—Pilotage is compulsory; the pilot boards 2 to 2.5 miles from the harbor entrance. Vessels should send an ETA at least 24 hours in advance.

Movements into and out of the port are restricted to daylight hours. Vessels up to a maximum length of 190m can be handled.

Anchorage.—The anchorage area for vessels awaiting berths is centered about 4 miles E of the Rio Tuxpan North Light.

Anchorage can be taken off the river entrance, in a depth of 13m, mud, with the lighthouse bearing 234° keeping well clear of the charted anchorage prohibited area. The currents are strong and unpredictable off the river entrance.

Directions.—Vessels from the S can approach the coast to within 5 miles and sight the landmarks previously mentioned.

A vessel approaching from the N should pass E and S of Bajo de Tuxpan and approach with Tuxpan Lighthouse bearing

257°. Bajo de Tuxpan is clearly visible by day in clear weather. In hazy visibility, when the lights are visible, a vessel should keep in depths of 27m or greater, anchor, and then await clear weather.

Caution.—The navigational lights at the river entrance are hard to identify and may often be confused with the numerous lights of fishing vessels found in the vicinity.

Between the Rio Tuxpan and Cabo Rojo, the low coast extends NW for a distance of 19 miles, then NNE an additional 18 miles, forming a bight called Puerto Lobos. This bight provides some protection from the northers which blow with considerable strength during the winter. A vessel with local knowledge can ride out the gale by using both anchors.

Cabo Rojo to the Rio Grande

7.36 Cabo Rojo (21°33'N., 97°20'W.), a blunt headland composed of sand hills 11m high, is bordered by a reef which extends 1.8 miles E from it. There are general depths of 18 to 46m lying about 4 to 5 miles offshore.

The coast extends NW for a distance of 49 miles from Cabo Rojo to the Rio Panuco, then 160 miles N and an additional 67 miles NNE to the Rio Grande. In general, the coast is composed of sand dunes and wooded hummocks. Mountain ranges with conspicuous peaks lie farther inland along the S part of this coast. Several extensive lagoons, separated from the coast by narrow strips of land, lie along this section and through it several rivers discharge into the gulf.

Tampico, a major oil port, lies within the entrance of the Rio Panuco.

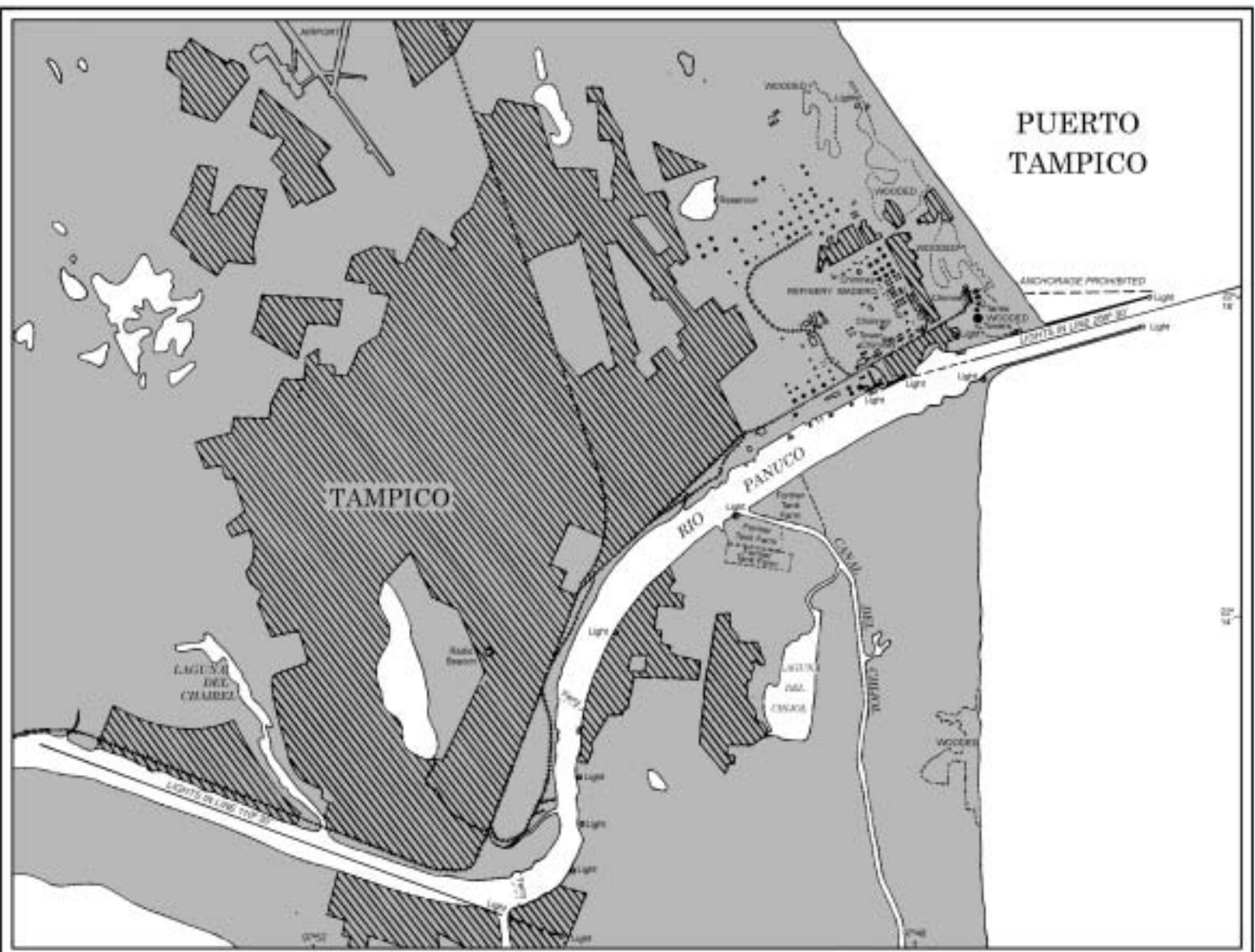
The 20m curve lies 4 miles E of Cabo Rojo and follows the coast 2 to 5 miles offshore to a position lying 9 miles E of the Rio Grande.

With the following exceptions, all of the dangers lie within the 20m curve and are described under the principal description of the coastal features:

1. An obstruction reported (1921) to exist about 32 miles E of the mouth of the Rio Panuco
2. A shoal, with a depth of 10m, lying 25 miles E of the entrance to Tampico harbor.
3. An isolated 2.5m shoal lying 5 miles SSE of the entrance to Tampico harbor.

During the winter, the current sets N; they set in the opposite direction during the summer. About 15 to 20 miles offshore, the current generally sets N at a rate of 1 knot. The winds are ESE from August to April and E from April to June. During the summer, the land breezes blow from midnight to 0900 and then yield to the sea breezes as far N as 26°N, where the mountain ranges terminate.

Between Cabo Rojo and the Rio Panuco, 49 miles NW, the coast is bordered by a narrow strip of land, 100m to 5 miles wide, fronting Laguna de Tamiahua. Canal del Chijol crosses this lagoon and is frequented by small craft going from Tuxpan to Tampico. The sand hills backing the coast 4 miles N of Cabo Rojo are 21m high and rise to heights of 106m about 18 miles farther N. The coast then becomes very low as far N as the Rio Panuco.



Tampico (22°16'N., 97°50'W.)

World Port Index No. 9360

7.37 Tampico consists of the lower reaches of the Rio Panuco, from a position lying 1 mile E of the breakwater heads, for a distance of 15 miles to a position lying 9 miles above Ciudad de Tampico. This city stands on the N bank of the river about 5 miles above the entrance. The port, an important center of the petroleum industry, has a considerable commercial trade. Ample berthing facilities are available to handle all classes of vessels alongside the river wharves.

Winds—Weather.—Hot SW winds blow in the months of March and April and usually begin about 1100 and sometimes last until 1500 or 1600, and then back to the ESE.

Northers are frequent during the winter season and usually last 8 to 24 hours. At such times the port is closed.

Tides—Currents.—The tides are irregular and in the vicinity of the bar are greatly affected by the prevailing winds and the rate of discharge from the Rio Panuco. The maximum rise above MLW is about 0.6m.

The general current in the Gulf of Mexico begins to be felt between S and SE about 1.5 miles offshore.

The Rio Panuco current, when the river is in flood, attains a velocity of 8.5 knots between the sea walls and a velocity of 6 knots in the upper reaches. Normally, the current in the river flows at a rate of 3 knots.

Depths—Limitations.—The depths in the approaches are subject to frequent changes and vessels should not enter without a pilot.

Uncharted dangers are reported to lie within 3 miles of the coast to the S and within 2 miles of the coast to the N of the mouth of the Rio Panuco. Considerable shoaling has been reported to extend up to 3 miles from the S breakwater.

A channel, 110m wide, leads across the bar and midway between the breakwaters into the river. The entrance bar has a controlling depth of 11m and is maintained by dredging. During the rainy season when the river is flooding, this depth will decrease due to heavy silting.

The principal wharves are situated on the N bank of the river. The public wharves provide about 850m of berthage; the private wharves provide about 2,285m of berthage.

A mineral ore-loading berth, 152m long with a depth alongside of 9.7m, is situated on the N bank close S of Tampico Light.

Ciudad Madero, on the N bank about 1.5 miles within the river, is the principal oil terminal. It has an alongside depth of 9.7m and can accommodate vessels up to 240m in length.

The Tergosa Terminal, which handles grain, has 500m of berthage with an alongside depth of 8.2m.

Fiscal Wharf, a general cargo berth, lies on the S side of the city. It is situated 6 miles within the entrance and has nine berths with alongside depths of 7.6 to 9.3m. Containers can also be handled here.

Cementos Anahuac, 3.5 miles W of Fiscal Wharf, has a berth, 500m long, with an alongside depth of 8.5m.

Puente Tampico, with a vertical clearance of 48m, crosses the river about 1.5 miles SW of the entrance to Canal del Chijol.

Aspect.—The harbor area may be identified by the numerous chimneys and tanks of the oil refineries. The hills to the S of the river are grass-covered and higher than those to the N, which are composed of whitish-gray sand. On closer approach, Tampico Light, standing on the N side of the river entrance, and the light structures situated on the breakwater heads will be sighted.

Pilotage.—Pilotage is compulsory for merchant vessels. Weather permitting, pilots board vessels by day or night from a launch about 2 miles outside the breakwater. Vessels may anchor there while awaiting the pilot. An ETA should be sent 24 hours in advance.

Anchorage.—Anchorage can be taken within the river, but permission must be obtained. Several prohibited anchorage areas, which may be best seen on the chart, lie in the approaches.

Directions.—Vessels should enter with the lighted range beacons bearing 256°30', keeping a little N of the range to avoid the shoals. The current sets N across the entrance at times and vessels should enter at a sufficient speed to offset it.

Caution.—The smoke from the refineries may make the main white light appear red when the wind is from the SW and the humidity is high.

Several offshore platforms stand about 18 miles E of the entrance to the Rio Panuco. A number of submarine pipelines lie in this area and extend W to the shore.

7.38 Altamira (22°25'N., 97°55'W.), a general cargo terminal, is situated 14 miles NNW of La Berra Light. It consists of a wet dock with berths for 16 vessels. The controlling depth in the approaches is 12.5m. There is a marginal quay, 250m long, with a depth alongside of 13m and ro-ro facilities.

The port handles bulk, container, and general cargo. Vessels up to 50,000 dwt, 210m in length, and 10m draft can be accommodated.

Pilotage is compulsory. The pilot boards 2 miles E of the breakwater as shown on the chart.

Between Tampico and Barra de Chavarria and Barra de La Trinidad, two shallow lagoon entrances lying 23 and 30 miles N, the coast is backed by wooded hills, about 60m high. A 5.5m shoal patch was reported (1912) to lie about 9 miles N of the Tampico harbor entrance. An obstruction was reported (1928) to lie 17 miles N of the Tampico harbor entrance. Shallow water lies up to 1.5 miles offshore between the entrances to the lagoons.

Cerro Metate (22°47'N., 97°58'W.), a flat-topped hill, 264m high, is located 32 miles NNW of Tampico.

Between Barra de La Trinidad and Barra del Torda, a shallow lagoon entrance lying 18 miles N, the coast is low and sandy. Some rocks lie up to 2 miles offshore in places.

Between Barra del Torda and the Rio Indios Morales (23°24'N., 97°46'W.), 28 miles N, the coast is backed by wooded hummocks, 21m high. From abreast Punta Jerez, a range of hills, Sierra de San Jose de Las Rusias, extends 52 miles N at a distance of 7 to 12 miles inland. A conspicuous sugarloaf peak is located 18 miles SW of the Rio Indios Morales.

The coast between the Rio Indios Morales and the Rio Soto La Marina, 21 miles N, is bordered by a narrow strip of land that fronts a lagoon.

Between the Rio Soto La Marina and Boquillas Cerradas (25°02'N., 97°30'W.), 77 miles N, and the Rio San Fernando, 25 miles farther NNE, the coast is bordered by a strip of land 1 to 5 miles wide fronting Laguna de La Madre. The high hills in the interior terminate 24 miles N of the Rio Soto de La Marina.

A shoal, 3 miles in extent, lies 25 miles N of the Rio Soto La Marina. It is located about 2 miles offshore and has a least depth of 4.6m.

Boquillas Cerradas are four nearly closed entrances of Laguna de La Madre.

The **Rio San Fernando** (25°23'N., 97°23'W.), with a depth of 0.9m on the bar, drains a lagoon in the interior.

A shoal, 3 miles long, with a least depth of 3m, lies with its S end located 5 miles N of the Rio San Fernando and about 3 miles offshore.

The **Rio Grande** (25°58'N., 97°09'W.), lying 36 miles N of the Rio San Fernando, forms the boundary between the United States and Mexico. By international agreement, the river is closed to navigation.